REMARKS

Favorable reconsideration of this application is respectfully requested in view of the following remarks.

The specification has been amended at several places to correct inadvertent typographical and grammatical errors. No new matter has been introduced.

Claim 1 has been amended to address the issue raised in the middle of page two of the Official Action concerning the wording in original Claim 1 pertaining to the electromagnetic pressure control valve. The original claim wording has been changed without narrowing the claim scope to recite that the electromagnetic pressure control valve is adapted to vary the opening degree thereof in dependence on the control electric current applied to the electromagnetic pressure control valve so that a pressure difference between the inlet and outlet ports is adjustable to a controlled pressure. In light of this amendment to Claim 1, withdrawal of the claim rejection based on the second paragraph of 35 U.S.C. § 112 is respectfully requested.

The claims in this application are directed to a brake pressure control device in a brake system where brake fluid whose pressure depends on the operation force applied on a brake pedal is supplied from a master cylinder to a wheel cylinder serving as a brake force generator to apply a brake force to a road wheel. The brake pressure control device comprises an electromagnetic pressure control valve having inlet and outlet ports respectively connected to the master cylinder and the wheel cylinder, with the opening degree of the pressure control valve being adapted to be varied depending on control electric current applied to the pressure control valve so that the pressure difference between the inlet and outlet ports is adjustable to a

controlled pressure. The brake pressure control device is also provided with a fluid pump having ejection and suction ports connected to the outlet and inlet ports of the electromagnetic pressure control valve respectively. Further, the brake pressure control device includes control means.

To better highlight differences between the brake pressure control device recited in independent Claim 1 and the disclosures contained in the documents relied upon in the Official Action, Claim 1 has been amended to recite that the control means varies the value of the control electric current applied to the electromagnetic pressure control valve for brake assist control and for slope starting control. The control means also operates the fluid pump when either the brake assist control or the slope starting control is required, to set the controlled pressure to an assist increase pressure upon execution of the brake assist control and to a stop holding pressure different from the assist increase pressure upon execution of the slope starting control.

Thus, with the brake pressure control device at issue here, the value of the control electric current that is applied to the electromagnetic pressure control valve is varied for brake assist control and for slope starting control. When the brake assist control and/or the slope starting control is required, the fluid pump is operated by the control means to set the controlled pressure to the assist increase pressure at execution of the brake assist control and to the stop holding pressure at execution of the slope starting control. This provides a relatively simplified construction because pressure adjustment for the brake assist control and the slope starting control can be achieved through suitable control of the electric current applied to the electromagnetic pressure control valve.

One of the documents relied upon in the Official Action is European Application Publication No. 1 067 032 to *Abe et al.* This document discloses a vehicle brake system provided with a master cylinder 3 and a vacuum booster 1 whose output side is connected to the master cylinder 3. The disclosed brake system is designed so that in the event of a failure of the vacuum booster 1, a pressure amplifying mechanism is utilized to increase the wheel brake pressure. At that point, even if it is determined that the vehicle has stopped, the system is maintained in a state in which increased brake fluid pressure is applied to the wheel cylinders. Once a predetermined time period has elapsed since the vehicle has stopped moving, the pressure amplifying mechanism no longer operates and the wheel cylinder is reduced.

Abe et al. discloses several different versions of the brake system. It is understood from the comments in the Official Action that the rejection of Claim 1 is based on the Fig. 5 embodiment of the vehicle brake system because the Official Action notes that the inversely connected proportioning control valve 142 corresponds to the claimed electromagnetic pressure control valve. The embodiment of the vehicle brake system illustrated in Fig. 5 of *Abe et al.* is designed to perform both a pressure amplifying assist brake control and a turn tracing control. The latter control is used to control the vehicle behavior while the vehicle is turning. The turn tracing control is carried out by controlling the brake fluid pressure supplied to each of the wheel cylinders 115-118 independently of one another so that the vehicle traces a target turning line. As discussed at the top of column 20 of *Abe et al.*, the inversely connected proportioning control valve 142 is designed so that the

brake fluid pressure applied to the wheel cylinders 115-118 is higher than the pressure in the master cylinder 101.

Once difference between the brake pressure control device recited in independent Claim 1 and the vehicle brake system illustrated in Fig. 5 of *Abe et al.* is that the brake system disclosed in *Abe et al.* does not utilize a control means that varies the value of control electric current applied to the inversely connected proportioning control valve 142 for a brake assist control and for a slope starting control and that operates the fluid pump when either the brake assist control or the slope starting control is required to set the control pressure of the valve 142 to an assist increase pressure upon execution of the brake assist control and to a stop holding pressure different from the assist increase pressure upon execution of the slope starting control. Further, as described in paragraph [0105] of *Abe et al.*, the SMC valves 131, 132 are brought into the closed state at the time of brake assist control. As a result, the pressure increased by the regulating valve 142 cannot be used in performing the brake assist control. It is thus not true that in *Abet et al.*, the pressure under the brake assist control is regulated by the regulating valve 142. Indeed, as noted above, the inversely connected proportioning control valve 142 operates so that brake fluid pressure applied to the wheel cylinders 115-118 is higher than the pressure in the master cylinder 101. It is thus respectfully submitted that the claimed brake pressure control device recited in independent Claim 1 is patentably distinguishable over the disclosure contained in *Abe et al.*

The Official Action also sets forth a rejection of independent Claim1 based on the disclosure contained in U.S. Application Publication No. 2003/0137192 to *Hano et al.* This document discloses a brake control apparatus that is able to perform a hill

hold control to hold the vehicle in the stopped state through application of a braking force even after completion of a driver's braking operation. The Official Action indicates that elements 5 or 8 disclosed in *Hano et al.* correspond to the claimed electromagnetic pressure control valve. It is assumed that the reference to element 8 in *Hano et al.* is an inadvertent error as element 8 is a motor. Element 5 is a normally open ON/OFF type inflow valve forming part of a pressure control section. The brake system described in *Hano et al.* is capable of performing both a brake assist control as well as a hill hold control. During brake assist control, the depression of the brake pedal BP causes the gate valve 301 to be closed and also causes the pump 4 to be driven by the motor 8 to discharge brake fluid downstream of the gate valve 301 as shown in Fig. 8. The wheel cylinder WC is thus provided with brake fluid pressure greater than the master cylinder pressure. In connection with the hill hold control, brake fluid pressure in each of the wheel cylinders WC is increased upon brake operation. This causes a pilot pressure to be applied to the gate valve 301 to position the gate valve 301 in a closed state. At this time, the normally open ON/OFF type inflow valve 5 is closed to confine the brake fluid pressure that has been increased in the wheel cylinder WC. The vehicle is thus maintained in a stopped state to carry out the hill hold control.

The normally open ON/OFF type inflow valve 5 described in *Hano et al.* cannot be said to correspond to the claimed electromagnetic pressure control valve because the normally open ON/OFF type inflow valve 5 disclosed in *Hano et al.* is not adapted to vary its degree of opening in dependence on a control electric current applied to the valve so that a pressure difference between the inlet and outlet ports is adjustable to a controlled pressure. Further, *Hano et al.* does not disclose providing

control means for varying the value of control electric current applied to the valve 5 for a brake assist control and for a slope starting control, and for operating the fluid pump 4 when the brake assist control or the slope starting control is required to set the controlled pressure to an assist increase pressure upon execution of the brake assist control and to a stop holding pressure different from the assist increase pressure upon execution of the slope starting control.

It is thus respectfully submitted that independent Claim 1 is also patentably distinguishable over the disclosure contained in *Hano et al.*

By way of this Amendment, new independent Claim 6 is also presented for consideration. This claim defines that the brake pressure control device comprises the electromagnetic pressure control valve and the fluid pump. In addition, Claim 6 defines the solenoid-operated shutoff valve means connected downstream of the electromagnetic pressure control valve between the electromagnetic pressure control valve and the wheel cylinder to control pressure increase, pressure holding and pressure decrease for the wheel cylinder. The control means varies the value of the control electric current applied to the electromagnetic pressure control valve for brake assist control and for slope starting control, and operates the fluid pump when either the brake assist control or the slope starting control is required to set the controlled pressure to the assist increase pressure at execution of brake assist control and to the stop holding pressure which is different from the assist increase pressure upon execution of the slope starting control. The control means is also operable upon anti-lock brake control to control opening and closing of the solenoid-operated shutoff valve means.

Neither *Abe et al.* nor *Hano et al.* discloses such a brake pressure control device in which an electromagnetic pressure control valve is used for the brake assist control and the slope starting control while the solenoid-operated shutoff valve means is used for controlling pressure increase, pressure holding and pressure decrease for the wheel cylinder. It is thus respectfully submitted that new independent Claim 6 is also allowable.

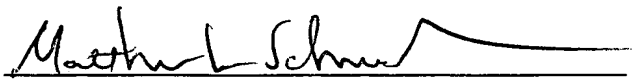
Early and favorable action with respect to this application is respectfully requested.

Should any questions arise in connection with this application or should the Examiner believe that a telephone conference with the undersigned would be helpful in resolving any remaining issues pertaining to this application, the undersigned respectfully requests that he be contacted at the number indicated below.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

Date: October 14, 2004

By: 
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